

THE CONTROL OF COMMUNICABLE DISEASES IN CAMPS.

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WE are now at war and a great wave of patriotism has passed over the country. Many people are making capital out of this war and we who are interested in the health of the people should not fail to capitalize this war to its fullest capacity. The enormous number of men who have been turned away from our army because of physical defects has called attention to the need of better things in the way of public health. We have before us, in the mobilization of this army, an unusual and very splendid opportunity for public health education. If we make the most of it the result of this war, as far as public health is concerned, will be good. If we fail to utilize the opportunity thus given, the public health movements of the country will lag as in the past. However, our education must, as far as possible, be logical in accordance with the best we know of the spread of the disease. My subject is on the control of communicable diseases in camp. A body of soldiers in camp offers an unusual opportunity for the control of diseases and at the same time soldiers living under these conditions are, to a very large extent, exposed to disease.

On table one are given the admission rates per thousand for the decade 1891 to 1900 and for each year from 1901 to 1915 for some of the com-

municable diseases which are common in the military service.

Measles.—During the decade from 1891 to 1900 the average admission rate was 10.91 per thousand. During the following decade it fell to 9.49 per thousand and, during the five years ending with 1915, it was 9.6 per thousand, a reduction of nearly 0.2 per thousand since 1900. Examining the individual year you will find that the rate varies greatly. For instance, in 1902 it was 14.41 per thousand. In 1908, it was 16.11 per thousand while in 1911 it was 17.29, the highest recorded during the period under consideration.

In the army the usual custom in checking an epidemic of measles has been to isolate each case as soon as it is discovered. The customs vary somewhat as to the contacts. In many instances they are placed in quarantine regardless of whether they have had the measles or not. In my sanitary work in the army during the past sixteen months, I have endeavored to handle this situation in what seems to me to be the more rational way. According to the studies made by Hill, it is probable that at the age of twenty years, 94 per cent of the men have had measles. The chances of the men having the measles a second time are not one in a hundred, therefore I feel that in handling an epidemic of measles, if we had a list of the men who have had the

TABLE I.
ADMISSION RATE PER THOUSAND OF COMMUNICABLE DISEASES IN THE
UNITED STATES ARMY.

Year	Scarlet fever	Measles	Small pox	Mumps	Diphtheria	Cerebrospinal meningitis
Average, 1891 to 1900.	0.14	10.91	1.06	7.24	0.55	0.26
1901.....	0.17	8.55	1.38	16.10	0.31	0.05
1902.....	0.22	14.41	1.30	15.80	0.26	0.07
1903.....	0.16	6.79	0.58	7.27	0.38	0.00
1904.....	0.00	14.42	0.34	10.23	0.19	0.00
1905.....	0.00	5.22	0.19	11.86	0.60	0.00
1906.....	0.00	6.41	0.27	17.91	0.30	0.09
1907.....	0.00	10.20	0.09	6.58	0.26	0.76
1908.....	0.00	16.11	0.23	12.22	0.92	0.26
1909.....	0.00	7.80	0.03	9.69	0.47	0.26
1910.....	0.00	4.96	0.21	3.65	0.85	0.14
Average.....	0.055	9.49	0.46	11.13	0.46	0.16
1911.....	0.10	17.29	0.07	14.46	0.63	0.00
1912.....	0.00	6.49	0.08	16.99	1.01	0.19
1913.....	0.00	6.44	0.10	7.85	2.98	0.43
1914.....	0.33	6.31	0.08	8.90	0.50	0.00
1915.....	0.74	8.71	0.05	8.02	0.88	0.36
Average.....	0.23	9.06	0.07	11.24	1.20	0.20

disease, we might very safely confine our attention to those who have not had the disease. If Hill's figures are correct, that would give us less than ten men per hundred to have under supervision. In some of the organizations that I have inspected the number of men who are not immune to measles by reason of a previous attack has been as low as 2 per cent. My custom is to parade the company in which the disease exists and make a hurried examination of every man, having him expose his chest and observing his eyes and mouth for symptoms of the disease. The men who have not had the measles are then separately paraded and their evening temperatures afterwards taken and recorded. The men having temperatures of not over $99\frac{2}{5}$ are examined again later on in the evening. Those who have tempera-

tures above that are placed in isolation for three or four days until the danger of development of measles is past. The men who have not had the measles are kept under observation for fourteen days.

This plan has been carried out at Fort Ethan Allen, Vermont, during the recent mobilization of troops and, although we have had a number of cases of measles introduced by new arrivals, the disease has not spread beyond those who were first exposed except in the case of one regiment where the conditions were handled in another way and where the spread was probably due to faulty technique in the management of the cases. When this epidemic was brought to my attention, the plan here outlined was put in operation, and the disease rapidly disappeared. This plan produces a

minimum amount of inconvenience for the organization as it interferes very little with their training and has proven to be satisfactory to the line of the army as well as to the medical officers of the post. The work of taking the temperatures can very readily be entrusted to a hospital attendant and the medical officers need not spend more than five or ten minutes per day on this work.

Diphtheria.—The admissions of diphtheria in the army for the decade 1891 to 1900 was 0.55 per thousand. During the following decade it was 0.46 per thousand. During the last five years the admissions amounted to 1.20 per thousand. Examining the individual more closely, we find that the disease was more prevalent during the years 1912 and 1913. It is a well known fact that, although by the use of antitoxine we have been able to reduce the death-rate from diphtheria, most of our efforts to control the disease have been without avail. This is probably because of the large numbers of carriers in the general population. In my work in the army, I have endeavored to search out the carriers whenever a case of diphtheria appeared and I feel that the time and efforts expended on this have resulted in a considerable reduction of the cases. As soon as a case is reported as a suspect, I immediately get in contact with the other men who live in the tent or in the same squad room with the suspected case. Their throats are examined and those showing enlarged tonsils or symptoms of inflammation are isolated. Cultures are taken from all of the intimate contacts. This has

resulted in the discovery of a number of carriers. In one outbreak that occurred in Texas about a year ago, I found in one regiment several carriers. All of these men were taken into the camp hospital and placed in isolation until negative cultures were obtained from their noses and throats. At one time we had in that hospital something like twenty-seven men who showed positive diphtheria cultures from their noses or throats. Not more than a half dozen of these had positive symptoms of the disease although most of them had enlarged tonsils. Those with diseases of the tonsils were operated upon and the others were treated by a number of different methods, the details of which I have not at hand at the present time. Strange as it may seem, all of these cases cleared up and were eventually discharged as cured of the disease. My present efforts for the prevention of diphtheria in this command consists of the following: At the semi-monthly physical inspection I have had the examining officers make lists of all men having enlarged tonsils. The tonsils in these cases are being removed as rapidly as possible, if the surgeon deems it advisable to do so, with the patient's consent. We have, by accident, found two positive cases of diphtheria in the command during the past six months and in both instances the infection resided in the tonsils and an operation resulted in a cure. We have also had one epidemic of Vincent's angina which was due to a carrier with enlarged tonsils. Removal of them also resulted in a cure. We did not have the facilities for determining the virility of the germs in

any of these cases. The Schick test should be used where possible.

Cerebrospinal Meningitis.—During my service in the army, I have had two experiences with cerebrospinal meningitis. The first occurred in 1899 and I had an opportunity of studying the pathology and the bacteriology of the disease with Dr. R. P. Strong. At that time very little was known of the method of spread and our efforts to control the disease were without avail. At about the height of the epidemic the troops entrained for San Francisco and only one additional case developed after leaving the post. I have always felt that the change from very much over-crowded barracks to the somewhat well ventilated train had more to do with the prevention of the disease than those measures adopted by the Medical Department.

During the past summer four cases of cerebrospinal meningitis developed at Fort Ethan Allen, Vermont. Before I knew of the first case, the entire organization to which the sick man belonged was placed under quarantine and an order was issued for the spraying of the noses and throats of each man with Dobell's solution. This was a very arduous undertaking and I felt at the time that very little was being accomplished. A few days later Major E. K. Dunham of the Rockefeller Institute arrived and he instituted measures of prevention which I think had a very decided effect upon the disease. He cultured all of the immediate contacts and found several who showed positive cultures. All of these contacts then had their noses and throats sprayed every two hours

for eight hours with Dichloramine-T solution. These measures promptly sterilized the noses and throats of the men and there was no spread of the disease. We were unable to locate the original source of the disease but it seemed to me to be located amongst the troops at a certain portion of the garrison. Later, however, Dr. Amos informed me that further study of the cultures taken by Major Dunham showed that there were two distinct strains of the diplococcus, and it is probable that there were two carriers. Amongst the contacts of the first case was one man who had enlarged tonsils filled with a cheesy matter. It may be possible that he was the original carrier in the case. In cerebrospinal fever the point to emphasize is the treatment for the carriers and the sterilization of the noses and throats of all the immediate contacts with a solution of Dichloramine-T according to the formula of Major Dunham.

Scarlet Fever.—Scarlet fever is not a very large factor in the morbidity of the United States army. I think it should be controlled very much as measles, only the number of days of observation need not be longer than eight or ten.

Mumps.—Mumps cause the largest admission rate of any of these particular classes of disease. These are very difficult to control and the only method that has been to any avail, as far as I know, has been the isolation of such and quarantine the contacts.

In dealing with soldiers it should be remembered that his movements can be absolutely controlled and as a rule you have sufficient force and facilities for properly carrying on these lines.